

# HOUSING OF ELECTRONIC PRODUCT

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## **Field of the Invention**

The present invention relates to a housing of an electronic product, and more particularly, to a housing of a mobile phone, the housing using a battery as a key member for dismantling and assembling.

## **Background of the Invention**

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While consumers' demands are changed day by day, more and more electronic products all have been emphasized on the capability of replacing the housings, thereby allowing consumers to vary the appearance of the electronic products in accordance with their individual requirements. On the other hand, since the DIY (Do It Yourself) has become a major trend in the consumer market, it is quite an important issue about how to allow consumers to briefly dismantle the product housing for product maintenance or upgrade, which further is one of the major factors affecting the market competitiveness.

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Currently, most of the housing-replacing tasks are performed by professional personals, wherein the steps thereof are so complicated to cause errors easily. Generally, consumers can only replace panels for the mobile phones having the special designs, but very few existing mobile phones can allow the consumers to easily replace the entire housings. Most of the mobile phones existing in the market achieve the function of housing-replacing by inseting tenons into mortises, thus combining the upper and lower housings by using the elasticity of housing material. However, extra consideration has to be taken for selecting the material forming the aforementioned

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type of mobile phone and making the design of the tenons and mortises therein, thus resulting in the increase of production cost. Meanwhile, when consumers try to separate the combined tenons from the mortises, it is very likely to break the tenons or the housing due to excessive force exerted.

5 Further, conventional mobile phones use the laser-printing process for fabricating the labels, such as numbers or function key label, shown on the surfaces of the push-buttons, and the cost thereof is quite high. Since the design of the surface of the housing is determined by the makers, consumers cannot design the surface of the housing in accordance with their favorites. The consumers have to buy various  
10 panels or housings provided by the makers, and then can only pick one of those panels or housings for replacing the housing of mobile phone. Frequently, the individual needs of the consumers still cannot be satisfied even after the consumers have simultaneously owned a lot of groups of panels or housings, thus wasting a lot of money and material.

15 Hence, there is a need to develop a housing of an electronic product, thereby simplifying the steps of replacing the housing, thus lowering the production cost and satisfying the individual needs.

### **Summary of the Invention**

It is an object of the present invention to provide a housing of an electronic  
20 product by using a battery as the key member for enabling the inner and outer housing members to be combined together, thereby simplifying the steps of replacing the housing.

It is the other object of the present invention to provide a housing of an electronic product, wherein an ordinary printing method can be used to substitute the  
25 laser-printing process for fabricating the labels shown on the surfaces of the

push-buttons, thereby lowering the production cost, and further allowing consumers to design the surface of the housing freely so as to satisfy their individual needs.

According to the aforementioned objects of the present invention, the present invention provides a housing of an electronic product, such as a mobile phone.

5        According to a preferred embodiment of the present invention, a housing of an electronic product comprises: an outer housing member; a background element; a push-button member installed on the background element; an inner housing member, wherein the inner housing member is installed on the push-button member; an elastic member, wherein the elastic member is installed on one side of an inner-housing  
10    recession portion opposite to a second key penetrating hole; and a key member installed in the inner-housing recession portion.

      The outer housing member has: an outer-housing recession portion; a first key penetrating hole and an outer-housing penetrating hole respectively located on two opposite sides of the outer-housing recession portion; and a plurality of first  
15    push-button penetrating holes located on the bottom of the outer-housing recession portion. The background element is installed in the outer-housing recession portion, and has a plurality of second push-button penetrating holes corresponding to the first push-button penetrating holes.

      The push-button member has a push-button base, and a plurality of protrusion  
20    elements, wherein the protrusion elements are exposed from an outer-housing surface of the outer housing member opposite to the opening direction of the outer-housing recession portion after respectively penetrating through the second push-button penetrating holes and the first push-button penetrating holes.

      The inner housing member has the inner-housing recession portion; a second  
25    key penetrating hole and an inner-housing protrusion portion respectively located on

two opposite sides of the inner housing member, wherein the second key penetrating hole is located inside the inner-housing recession portion, and the inner-housing protrusion portion penetrates into the outer-housing penetrating hole for fastening the inner housing member and the outer housing member; and an inner-housing recession  
5 bottom located on an inner-housing surface opposite to the opening direction of the inner-housing recession portion, for accommodating the push-button base.

Two opposite sides of the key member have respectively: a first key protrusion portion and a second key protrusion portion, wherein the first key protrusion portion penetrated through the second key penetrating hole and into the first key penetrating  
10 hole, for fastening the inner housing member and the outer housing member, and the second key protrusion portion compressed the elastic member so as to reinforce the fastening of the key member to the inner-housing recession portion, wherein the elastic member is used for easily taking out the key member.

Hence, with the application of the present invention, the steps of replacing a  
15 housing can greatly simplified; the production cost can be lowered by substituting the laser-printing process with an ordinary printing method for fabricating the labels shown on the surfaces of the push buttons; and consumers can design the surface of the housing freely so as to satisfy their individual needs.

#### **Brief Description of the Drawings**

20 The foregoing aspects and many of the attendant advantages of this invention will become more readily appreciated as the same becomes better understood by reference to the following detailed description, when taken in conjunction with the accompanying drawings, wherein:

Fig. 1A is a schematic top view of a housing of an electronic product, according  
25 to a preferred embodiment of the present invention;

Fig. 1B is a schematic bottom view of the housing of the electronic product, according to the preferred embodiment of the present invention;

Fig. 2 is a schematic explosive view of the housing of the electronic product, according to the preferred embodiment of the present invention; and

5 Fig. 3A to Fig. 3D are schematic cross-sectional views showing the steps of dismantling the housing of the electronic product, according to the preferred embodiment of the present invention.

### **Detailed Description of the Preferred Embodiment**

Referring to Fig. 1A and Fig. 1B, Fig. 1A is a schematic top view of a housing  
10 of an electronic product, according to a preferred embodiment of the present invention; and Fig. 1B is a schematic bottom view of the housing of the electronic product, according to the preferred embodiment of the present invention. According to the present invention, an inner housing member 120 is disposed in an outer housing member 100, and a key member 130 thereof is installed in a recession portion of the  
15 inner housing member 120, wherein the key member 130 can be such as a battery. The outer housing member 100 has a display opening 101 used for installing a display screen, and has a plurality of openings used for exposing a plurality of protrusion elements 112.

Referring Fig. 2, Fig. 2 is a schematic explosive view of the housing of the  
20 electronic product, according to the preferred embodiment of the present invention. According to the present invention, the housing of the electronic product is mainly composed of the outer housing member 100; the inner housing member 120 installed in the outer housing member 100; an elastic member 126 (such as a spring) installed in the inner housing member 120; and the key member 130 installed in the recession  
25 portion 122 of the inner housing member 120. A background element 140 and a

push-button member 110 may be installed between the outer housing member 100 and the inner housing member 120, wherein the inner housing member 120 is installed on the push-button member 110 and a portion of the background element 140

The outer housing member 100 has the following parts: an outer-housing  
5 recession portion 106; a first key penetrating hole 104 and an outer-housing  
penetrating hole 108 respectively located on two opposite sides of the outer-housing  
recession portion 106; and a plurality of first push-button penetrating holes 102 located  
on the bottom of the outer-housing recession portion 106 penetrating through the  
surface of the outer housing member 100, wherein the background 140 is installed in  
10 the outer-housing recession portion 106, and has a plurality of second push-button  
penetrating holes 142 corresponding to the plurality of first push-button penetrating  
holes 102. The push-button member 110 has a push-button base 114 and a plurality  
of protrusion elements 112 (such as the push buttons of a mobile phone) located on  
said push-button base 114, wherein the protrusion elements 112 are exposed from an  
15 outer-housing surface of the outer housing member 100 opposite to the opening  
direction of the outer-housing recession portion 106 after respectively penetrating  
through the first push-button penetrating holes 102 and the second push-button  
penetrating holes 142. The background element 140 can be a sheet of paper, on  
which users can print labels, patterns, etc. arbitrarily, and thereafter those printings can  
20 be shown via the transparent portion of the outer-housing surface of the outer housing  
member 100, thereby satisfying the individual needs of the users. The outer housing  
member 100 can be the housing of all or partial transparent.

The inner housing member 120 has an inner-housing recession portion 122; a  
second key penetrating hole 124 and an inner-housing protrusion portion 128  
25 respectively located on two opposite sides of the inner housing member 120, wherein

the second key penetrating hole 124 is located on one side of the inner-housing  
recession portion 122, and the inner-housing protrusion portion 128 penetrates into the  
outer-housing penetrating hole 108 so as to fasten one side of the inner housing  
member 120 on the outer housing member 100; and an inner-housing recession bottom  
5 127 located on an inner-housing surface opposite to the opening direction of the  
inner-housing recession portion 122, wherein the inner-housing recession bottom 127  
is used for accommodating the push-button base 114. Moreover, an elastic member  
126 is installed on another side of the inner-housing recession portion 122 opposite to  
the second key penetrating hole 124.

10        There are a first key protrusion portion 134 and a second key protrusion portion  
132 respectively formed on two opposite sides of the key member 130. When the key  
member 130 is installed in the inner-housing recession portion 122, the first key  
protrusion portion 134 penetrates the second key penetrating hole 124 and the first key  
penetrating hole 104, so as to fasten another side of the inner member 120 opposite to  
15 the inner-housing protrusion portion 128 on the outer member 100, and the second key  
protrusion portion 132 compresses the elastic member 126 so as to reinforce the  
fastening of the key member 130 to the inner-housing recession portion 122, thereby  
increasing the combination tightness of the inner housing member 120 and the outer  
housing member 100. On the other hand, the elastic member 126 is used for allowing  
20 the key member 130 to be taken out of the inner-housing recession portion 122 easily.  
It is worthy to be noted that the key member 130 can be such as a battery of mobile  
phone or any other applicable components. As to other electronic components, they  
can be installed in the proper positions between the inner housing member 120 and the  
outer housing member 100.

25        To sum up, according to the present invention, a housing of an electronic

product does not need to use such as screws or tenons and mortises to assembly the housing, but use a battery of mobile phone (the key member 130) as the key component for dismantling or assembling the housing. In other words, the assembly of the housing can be completed by first inserting the inner-housing protrusion 128 into the outer-housing penetrating hole 108; then placing the key member 130 into the inner-housing recession portion 122; letting the first key protrusion portion 134 penetrate into the second key penetrating hole 124 and the first key penetrating hole 104 respectively; and holding the elastic member 126 against the second key protrusion portion 132, wherein the force and the reaction force between the key member 130 and the elastic member 126 can tightly combine the inner housing member 120 and the outer housing member 100.

Further, referring Fig. 3A to Fig. 3D, Fig. 3A to Fig. 3D are schematic cross-sectional views showing the steps of dismantling the housing of the electronic product, according to the preferred embodiment of the present invention. While dismantling the housing, a pushing force 200 is exerted to move the key member 130 towards the elastic member 126 (such as shown in Fig. 3A), thereby set the first key protrusion portion 134 apart from the second key penetrating hole 124 and the first key penetrating hole 104. Thereafter, a pulling force 210 is exerted to take the key member 130 out of the inner-housing recession portion 122 (such as shown in Fig. 3B). Then, a pulling force 220 is exerted to separate the inner-housing protrusion portion 128 of the inner housing member 120 from the outer-housing penetrating hole 108 (such as shown in Fig. 3C). After the inner housing member 120 is taken out of the outer-housing recession portion 106, the push-button member 110 and the background element 140 can be separated from the outer-housing recession portion 106, so that the job for dismantling the housing is completed (such as shown in Fig. 4D).



It can be known from the aforementioned preferred embodiment of the present invention, the advantages of applying the present invention are: greatly simplifying the steps of replacing the housing; lowering the production cost by using an ordinary printing method to substitute the laser-printing process for fabricating the background  
5 element for showing the labels of the push-buttons; allowing consumers to design the surface of the housing freely so as to satisfy their individual needs; and having highly industrial value since the housing has a strong integrated structure and is easily fabricated without the limitation of material.

As is understood by a person skilled in the art, the foregoing preferred  
10 embodiments of the present invention are illustrated of the present invention rather than limiting of the present invention. It is intended to cover various modifications and similar arrangements included within the spirit and scope of the appended claims, the scope of which should be accorded the broadest interpretation so as to encompass all such modifications and similar structure.

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